TOSHIBA STEREO AMPLIFIER

SERVICE DATA

MODEL SB-500

FILE NO. 170-010

SPECIFICATIONS

Main Amplifier Section

Output power:	IHF music power	90W (8Ω)145W (4Ω)
	RMS (1kHz) per channel operating	35W x 2 (8Ω) 50W x 2 (4Ω)
	RMS (1kHz) both channels operating	30W+30W (8Ω) 40W+40W (4Ω)
	RMS(20Hz~20kHz)both channels operating	25W+25W (8Ω)
Distortion factor:	total harmonic distortion 0.2% at rated output IM distortion 0.2% at rated output	
Frequency response:	10Hz ~ 70kHz ±1dB	
Power bandwidth:	10Hz ~ 40kHz (IHF)	
Input sensitivity and impedance:	Main-in 0.55V (47kΩ)	
Residual noise:	0.5mV (8Ω)	
Damping factor:	20 (8Ω)	
Speaker impedance:	4 ~ 16Ω	

Pre-amplifier Section

Input sensitivity and impedance:	PHONO 1	MAG	2.5mV (47kΩ)
		CC	30mV (70kΩ)
	PHONO 2		2.5mV (47kΩ)
	TUNER		150mV (100kΩ)
	AUX 1		150mV (100kΩ)
	AUX 2		150mV (100kΩ)
	MIC		4mV (50kΩ)

Output level for recording:	TAPE REC	150mV
	DIN	30mV
Rated output:	PRE OUT	0.55V(4.5Vmax)
Frequency Response:	20Hz ~ 30kHz ±1dB	
Harmonic distortion:	0.03% at rated output	
Tone controls:	BASS	Turnover Frequency 1kHz ±10dB at 100Hz 400Hz ±5dB at 100Hz
	TREBLE	Turnover Frequency 1kHz ±10dB at 10kHz 4kHz ±5dB at 10kHz
Loudness control:	+ 10dB (100Hz, VR 20% position) + 4dB (10kHz, VR 20% position)	
Equalizing curve:	RIAA ±0.3dB	
S/N ratio:	PHONO MAG (2.5mV)	65dB
	AUX (150mV)	80dB
	MIC	65dB
Power source:	AC 100/120/220/240V 50/60Hz	
Power consumption:	120W	
Semiconductors:	32 transistors 8 diodes 1 IC	
Dimensions:	400mm (W) x 320mm (D) x 115mm (H) (15¾"(W) x 12½"(D) x 4½" (H))	
Weight:	7.6kg (15 1/6 lbs)	
Accessories:	Silicon cloth, Felt pads and owner's manual.	

TOKYO SHIBAURA ELECTRIC CO., LTD.

2-1, 5-CHOME, GINZA, CHUO-KU, TOKYO, JAPAN

TABLE OF CONTENTS

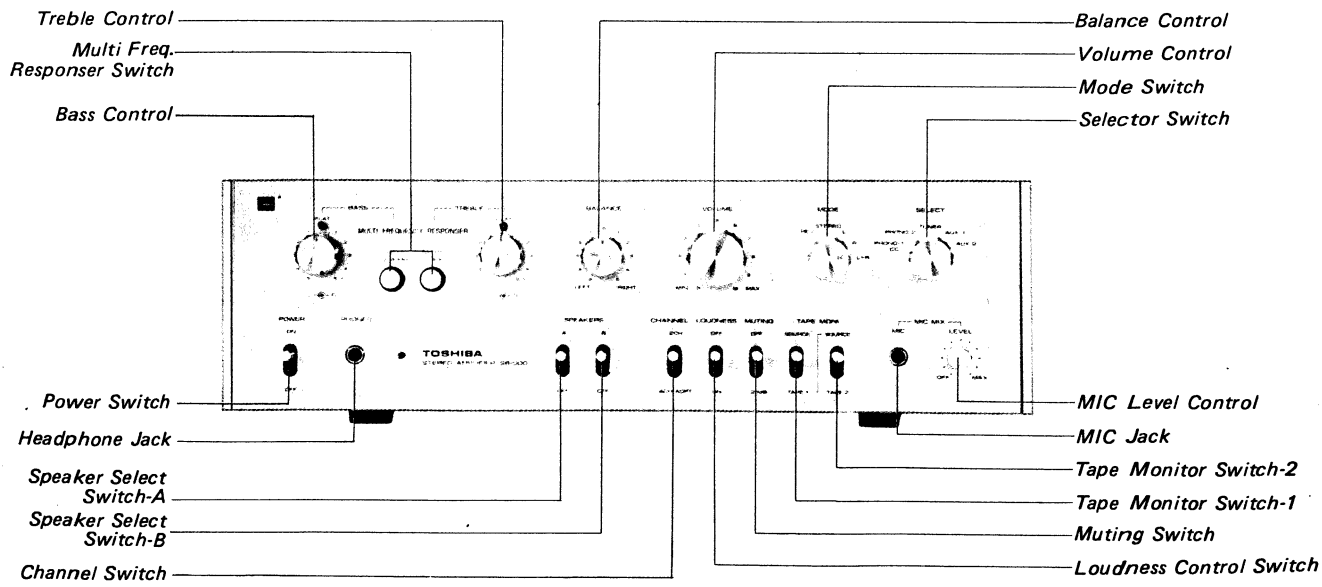
		Page
1.	OPERATING CONTROLS	
1-1	Front View	2
1-2	Rear View	3
2.	PARTS LOCATION	
2-1	Chassis Top View	3
2-2	Chassis Bottom View	4
2-3	Voltage Adjustment	4
3.	DISASSEMBLY	
3-1	Cabinet Removal	5
3-2	Back Cover Removal	5
4.	LEVEL DIAGRAM	6
5.	TRANSISTOR BASE DIAGRAM	6
6.	INTEGRATED CIRCUIT BASE DIAGRAM	6
7.	TECHNICAL POINTS	7
8.	ADJUSTMENT	8
9.	TROUBLE SHOOTING HINTS	9
10.	SCHEMATIC DIAGRAMS	
10-1	EQ Circuit Board (AF-C09A)	10
10-2	Tone Control Circuit Board (AF-C21)	11
10-3	Mic Amp Circuit Board (MIC-C01)	12–13
10-4	Power Supply Circuit Board (SPLY-C08)	14
10-5	Protector Circuit Board (PRO-C05)	14
10-6	Driver Circuit Board (AF-C22)	15–16
11.	GENERAL	17–18
12.	EXPLODED VIEW	19–20
13.	PACKING	21
14.	PARTS LIST	22–24

MODEL DESCRIPTIONS

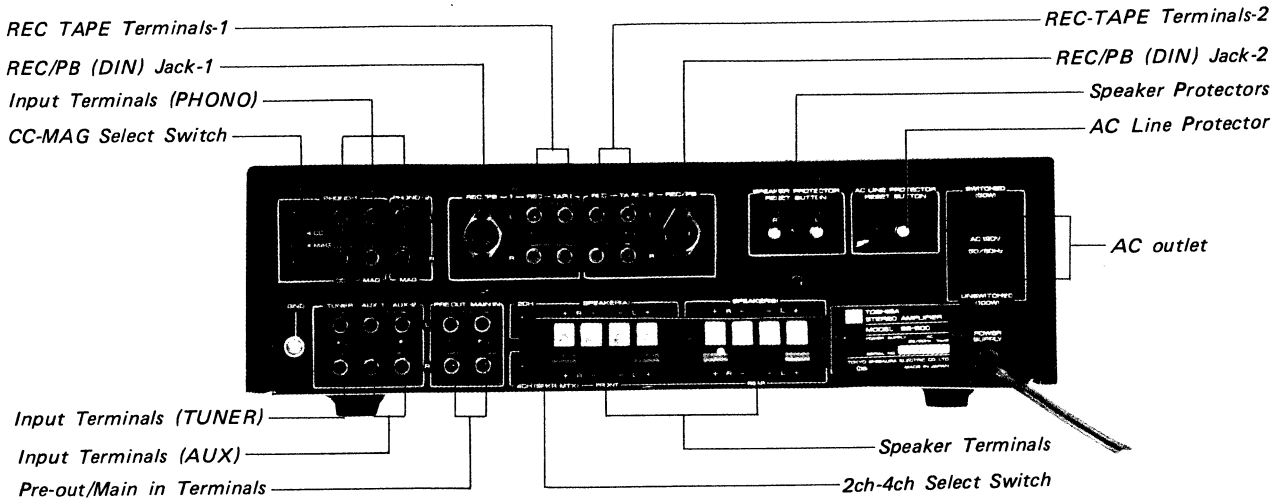
TA: For U.S.A	**TE: For Europe**
TC: For Canada	**VL: For all other country except special**

1. OPERATING CONTROLS

1-1 FRONT VIEW

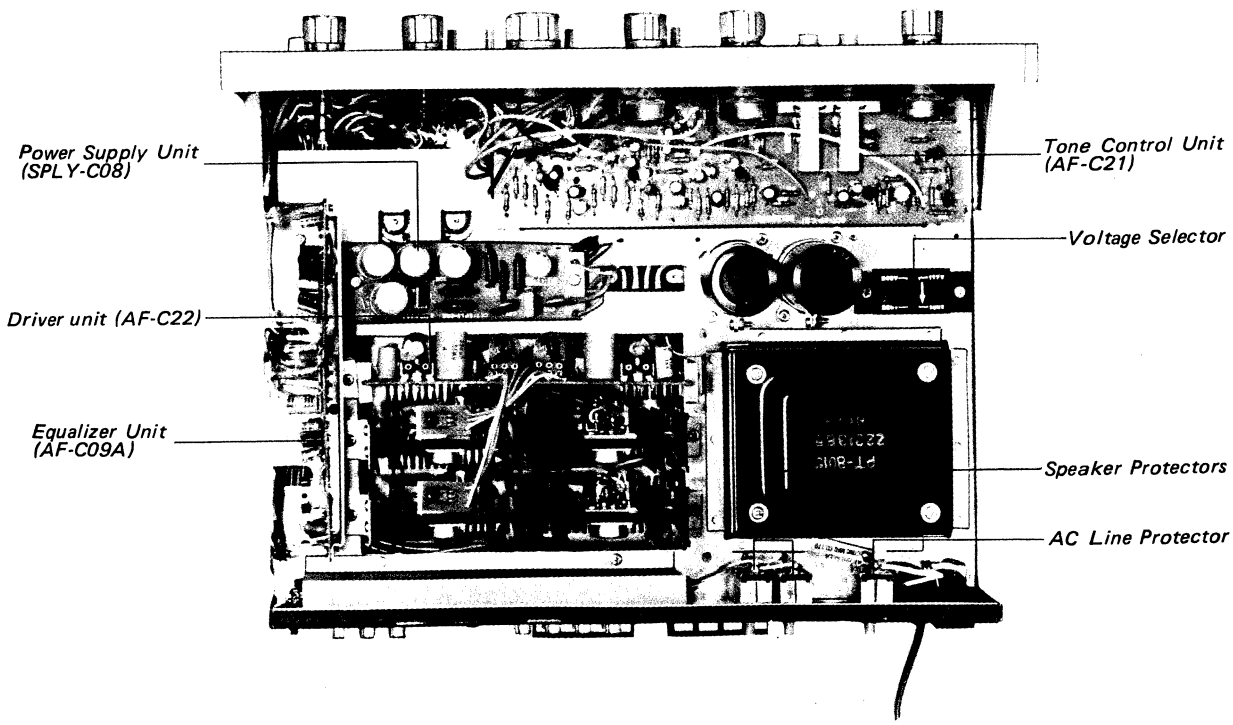


1-2 REAR VIEW

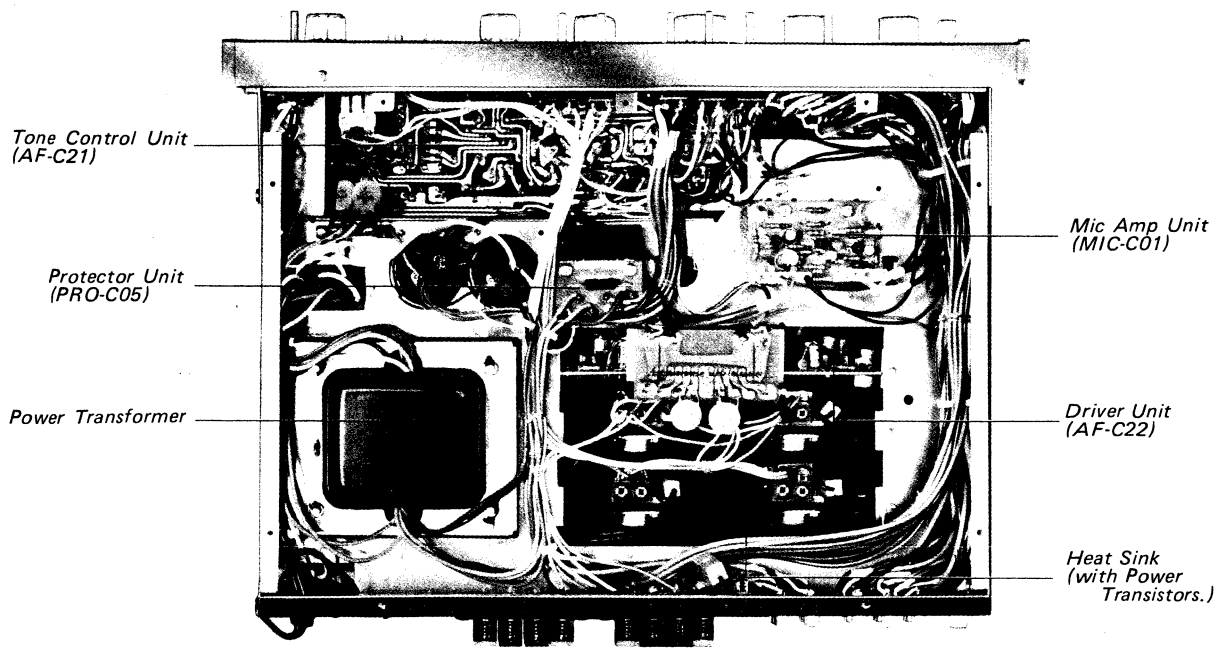


2. PARTS LOCATION

2-1 CHASSIS TOP VIEW

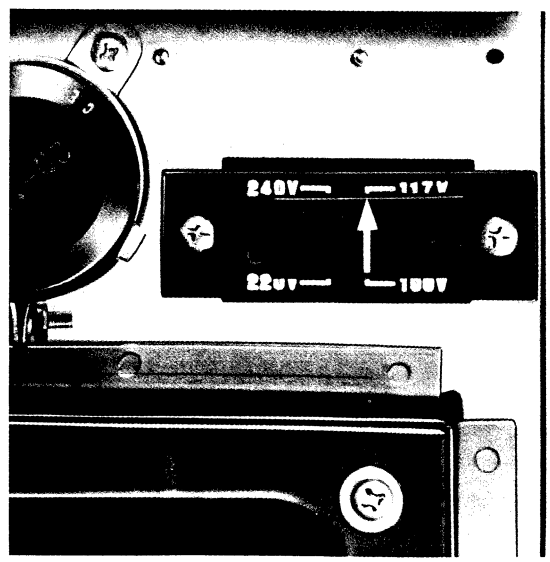


2-2 CHASSIS BOTTOM VIEW



2-3 VOLTAGE ADJUSTMENT

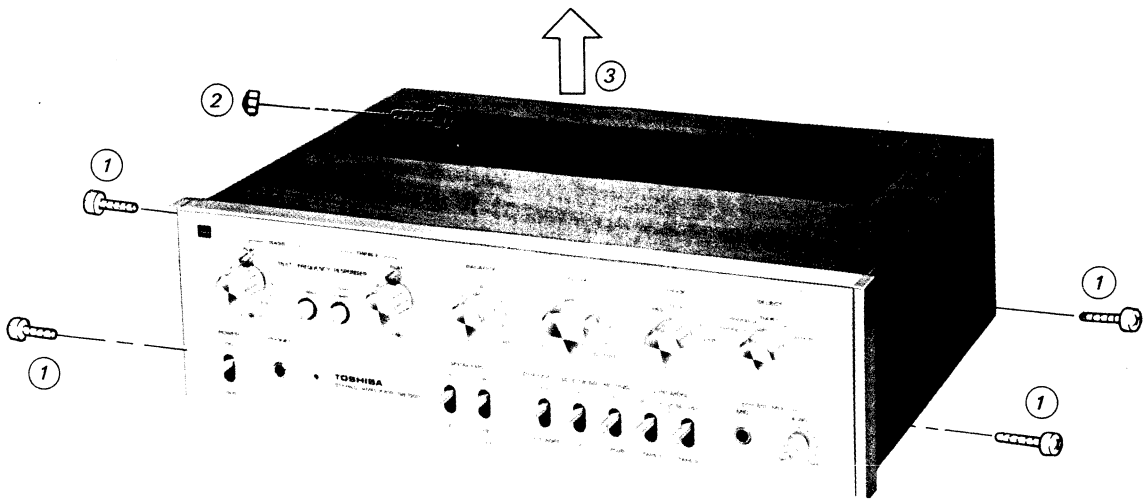
Insert the pin, adjusting the arrow in the direction of the power supply voltage applied.



3. DISASSEMBLY

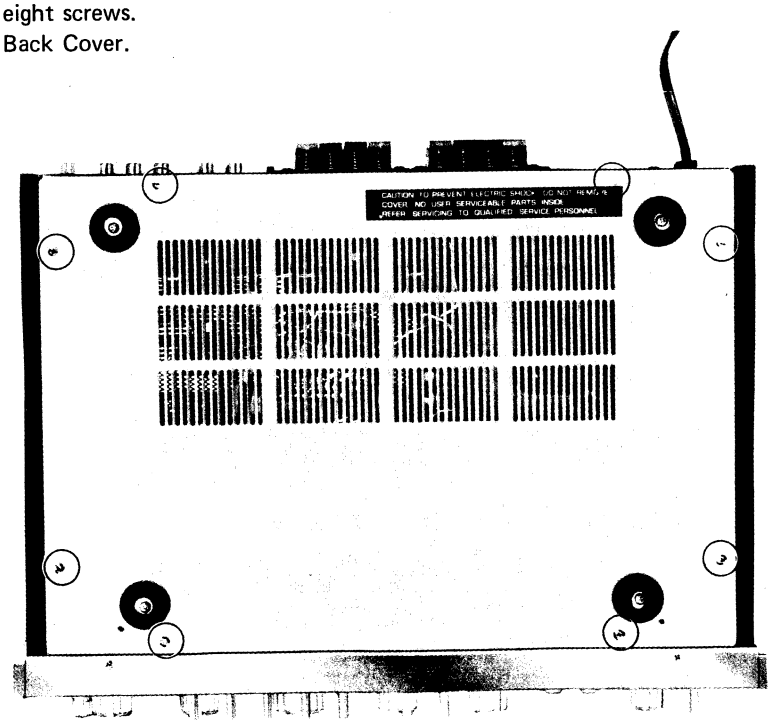
3-1 CABINET REMOVAL

1. Remove the four screws (①).
2. Remove the one screw (②) (TA, TC).
3. Pull out the Cabinet (③).

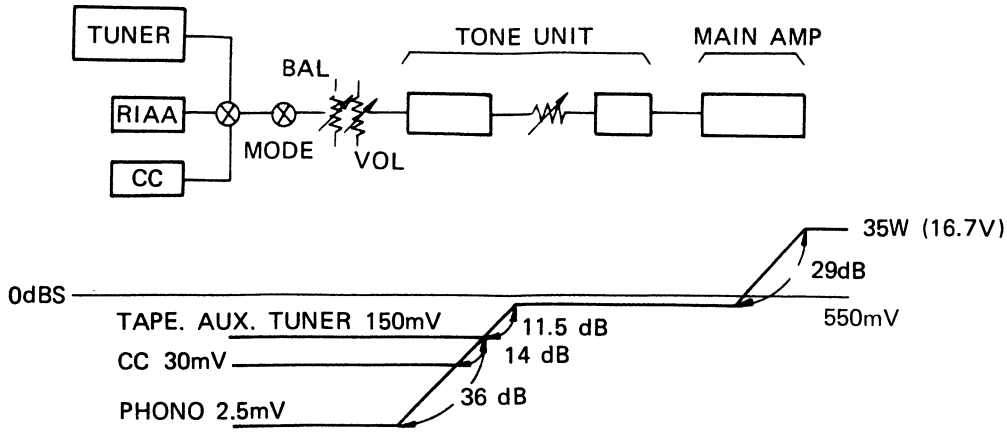


3-2 BACK COVER REMOVAL

1. Remove the eight screws.
2. Remove the Back Cover.

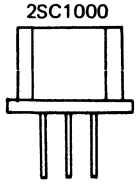


4. LEVEL DIAGRAM



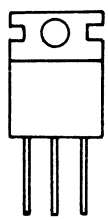
5. TRANSISTOR BASE DIAGRAMS

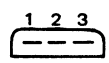
2SC1000



1. Emitter
2. Collector
3. Base

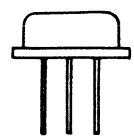
2SD235

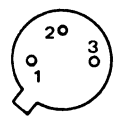




1. Base
2. Collector (Radiation Board)
3. Emitter

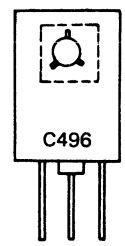
2SA497
2SC497

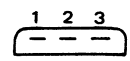




1. Emitter
2. Base
3. Collector (Case)

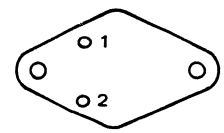
2SC496





1. Emitter
2. Collector
3. Base

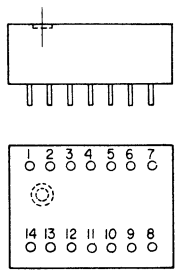
2SA663
2SC793

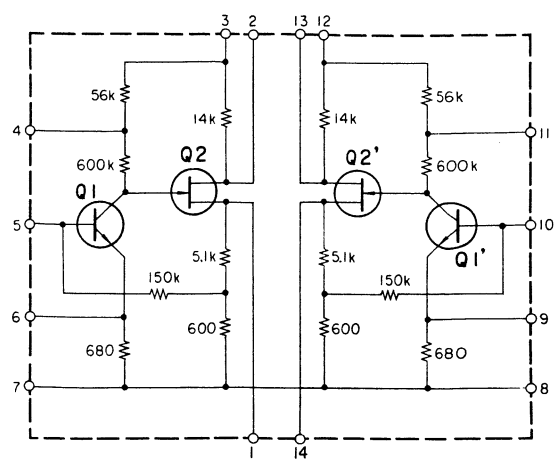


1. Emitter
2. Base
3. Case Collector

6. INTEGRATED CIRCUIT BASE DIAGRAM

TH9014P





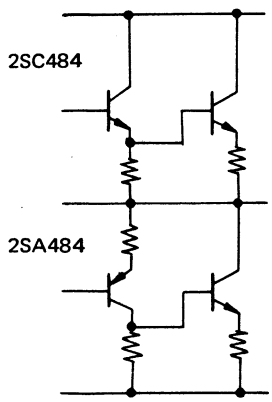
7. TECHNICAL POINTS

1. PURE COMPLEMENTARY CIRCUIT SYSTEM

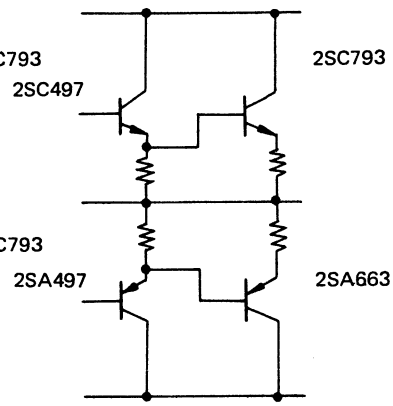
The difference between the Pure Complementary Circuit and the Quasi Complementary Circuit is that the Darlington connections in the lower part are, as shown in the figure below, connected to PNP-NPN for the Quasi Complementary Circuit and to PNP-PNP for the Pure Complementary Circuit.This difference results in the cross-over distortion in the unit. Although the switching distortion is inevitable with B class P-P amplifier, the Pure Complementary Circuit, where both upper and lower transistors are symmetrical each other, these distortions are canceled each other and the action similar to A class action is provided.

This can be afforded only with the newly developed PNP transistors, 2SA663, which are produced by the Toshiba's semiconductor manufacturing technology.

The distortion can be kept under 0.1% even with 10 KHz at rated output and PBW is also greatly improved with the use of this transistor.



Quasi Complementary Circuit
(SA-20, SA-15)



Pure Complementary Circuit
(SB-500)

2. DIRECT-COUPLING OUTPUT CAPACITOR LESS CIRCUIT SYSTEM

The following features are available by adopting the Output Capacitor Less of the direct-coupling two-power source system:

(1) Stable extension of frequency characteristic to the ultra low frequency range becomes possible.

(2) The output impedance (Damping Factor) does not vary even in the ultra low frequency range.

This feature together with the Pure Complementary Circuit system mentioned above is regarded as the one for the most ultimate and perfect amplifier today.

The most serious problems with the direct-coupling amplifier are the DC drift due to the temperature variation and the possibility of the occurrence of excess direct current to the speaker, which is caused by the transient shock at the moment of switching on the power supply and the unlikely break of the power transistors. In the model SB-500, these problems are resolved in such ways as follows: A differential amplifier consisting of the transistors of high current amplification factor, HFE, is incorporated in this unit in order to raise its DC stability. This shock at the moment of supply of power is reduced to some extent by inserting the twin-T type filter in the unit.

The speaker is safely protected against unlikely accident of transistor break by incorporating the circuit breaker between the speaker terminal and output circuit. On the contrary, in the case of shorting of the speaker terminal, the output circuit is protected by the circuit breaker built-in.

3. BUILT-IN SPECIAL AMPLIFIER FOR CONDENSER-CARTRIDGE

See SB-404 Technical Notes.

4. MULTI-FREQUENCY RESPONSER (MFR)

See SB-404 Technical Notes.

Since the tone control of NF type is furnished in SA-500, tone undulation at the medium tone is almost negligible.

5. CONNECTION FOR 4-CHANNEL ADAPTER

You can easily enjoy the contrast between 2-channel and 4-channel by using 2-ch/4-ch adapter switch located in the front panel and by connecting this amplifier to the QM decoder (Model No. SC-410).

For details refer to the instruction manual for 4-channel adapter.

8. ADJUSTMENT

CAUTION:

Never short-circuit the speaker terminal.
When a strong input is fed to the speaker or the speaker terminal is short-circuited, the output circuit is protected against the possible damage through the function of the protection circuit.
After the protection circuit worked, push the protect or reset button located on the rear panel.

Equipment:

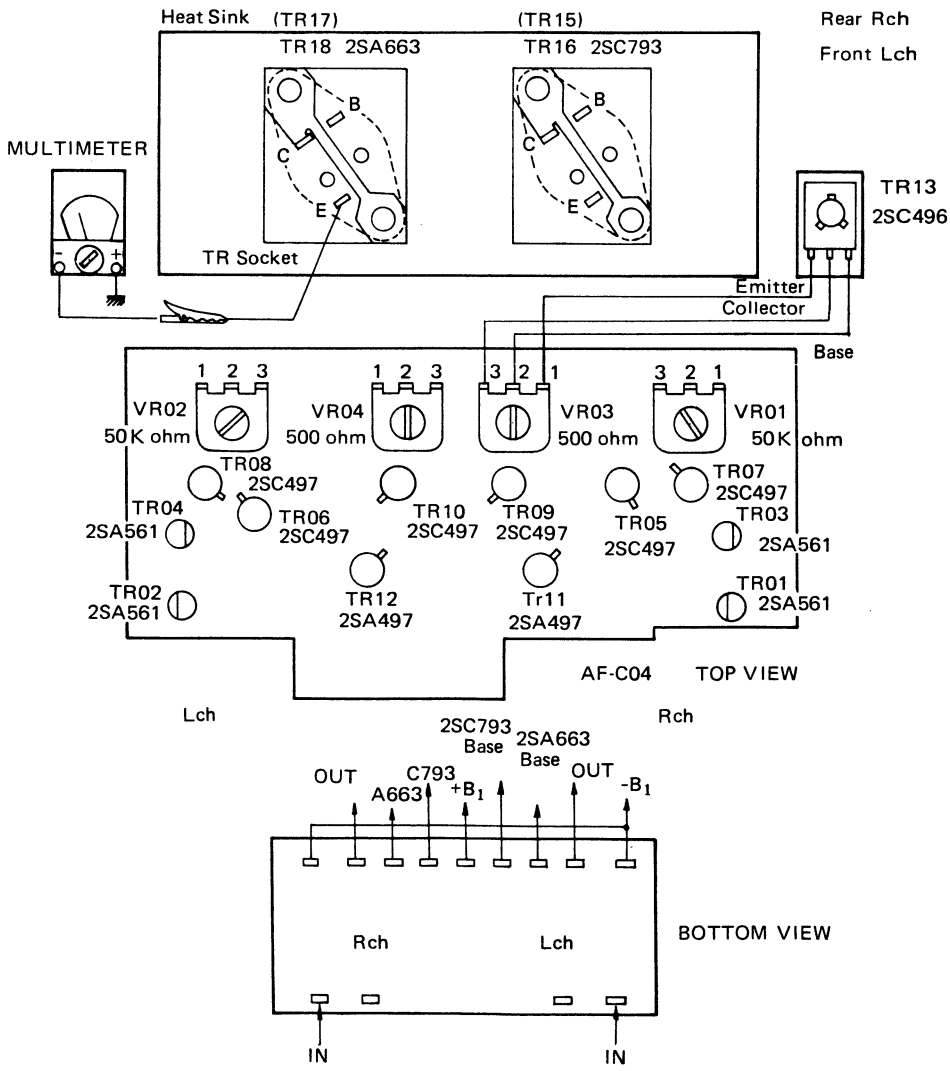
1. Multimeter
2. Audio Generator
3. Oscilloscope
4. Electronic Voltmeter (AC-VTVM)

MAIN AMP BIAS ADJUSTMENT

	STEP	ADJUSTMENT	REMARKS
1	Center Potential Balance	VR01,VR02 (50k Kohm Potentiometer)	Adjust for 13, 14 = 0 volt. (or Speaker terminal)
2	IC idle Adjustment	VR03,V04 (500 ohm Potentiometer)	Adjust for Ve=0.02 Volts, TR15 or TR16

Note:

VR01-04 should be preset to the mid-position before adjustment.



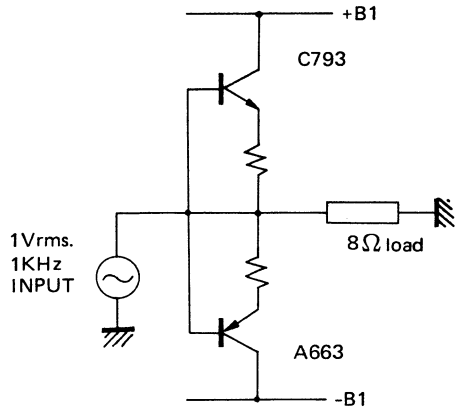
9. TROUBLE SHOOTING HINTS

How to examine the output power transistors:

Step 1. Remove the driver unit (AF-C04) from the connector. Also TR13 and TR14 (2SC496) are to be removed.

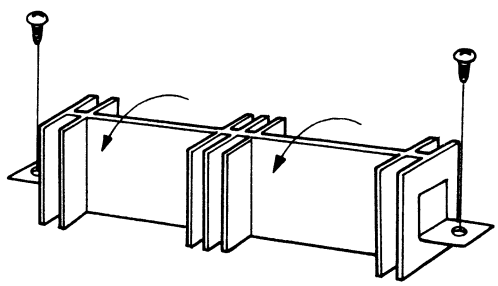
Step 2. Measure the voltage at the speaker output terminal or terminals 13 & 14 using a tester, with the power switch on.
OV (± 0.3V) indication is normal.

Step 3. Waveforms observation. Normal waveform illustrated below.

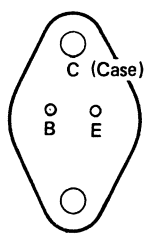


Replacement of defective power transistors:

Step 1. Remove the self-tap screws on both sides of the transistor and incline it forward as illustrated below.



Step 2. Remove the mounting screws securing the collector of the power transistor and pull out the transistor. (This is easily replaceable because TR socket is in use.)



How to examine the drive unit:

Note: If it is likely to break the power transistors during examination, disconnect the leads to the bases of 2SC793 and 2SA663.

Can one get correct mid-voltage?

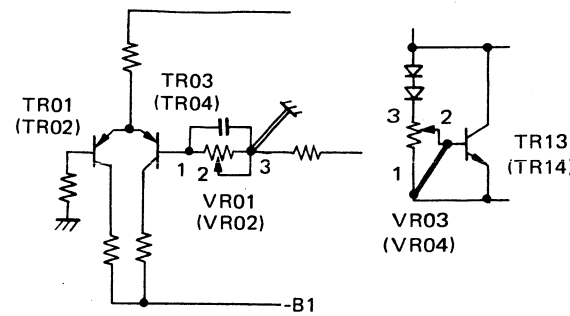
Step 1. If OK ..... Does the voltage between the collector and the emitter of TR13 or TR14 (2SC496) change with variation of VR03 or VR04 (500 ohm)? (1.9V-3.5V)

Step 2. OK ..... Normal
Adjust IC idle by VR03, VR04 with power transistors connected.
NO ..... 2SC496 is defective.

Step 3. If NOT .... If perfect adjustment to zero voltage is not possible (normally this is variable to both + and −, but in this case it is impossible), this is due to the rank difference between h_{FE}s of TR01/03 or TR02/04. Adjust the rank.

Check if the correct mid-voltage is obtainable or not.

Step 4. Examine TR, removing TR09 and TR11 (TR10 and TR12).
(Note) In many cases one meets troubles with TR09 and TR11.



Step 5. As shown above, connect the terminal 3 of VR01 to the ground, where TR09 and TR11 are kept removed and VR01 fully turned to the terminal 3 side. Short-circuit the base with emitter.

Examine if collector voltage of TR05 (TR06) is adjustable to zero voltage with the power switch on.

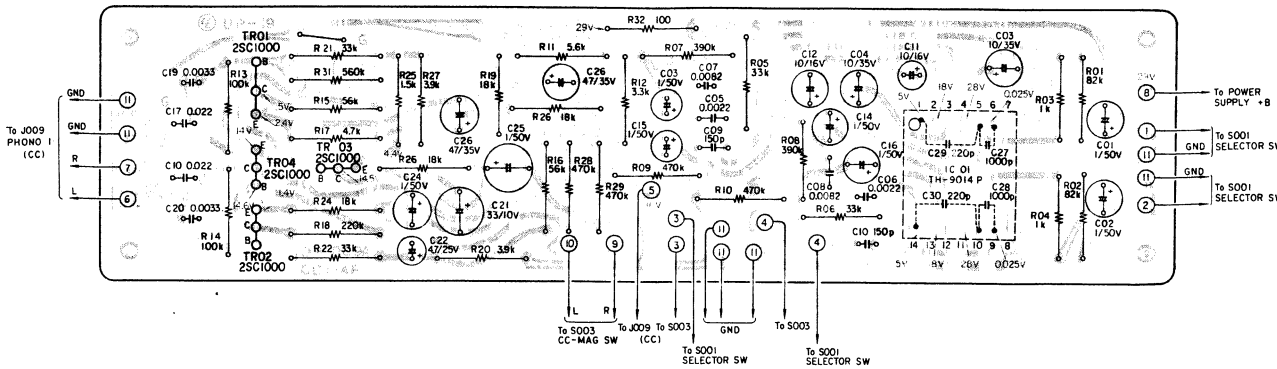
If OK ..... Examine if the voltage between collector and emitter of TR13 changes with variation of the semi-fixed VR03 (VR04) when the short-circuit between the base and the emitter of TR13 is released. (Step 1.)

If NOT ..... Check the transistors, TR01, TR03, TR05 and TR06.

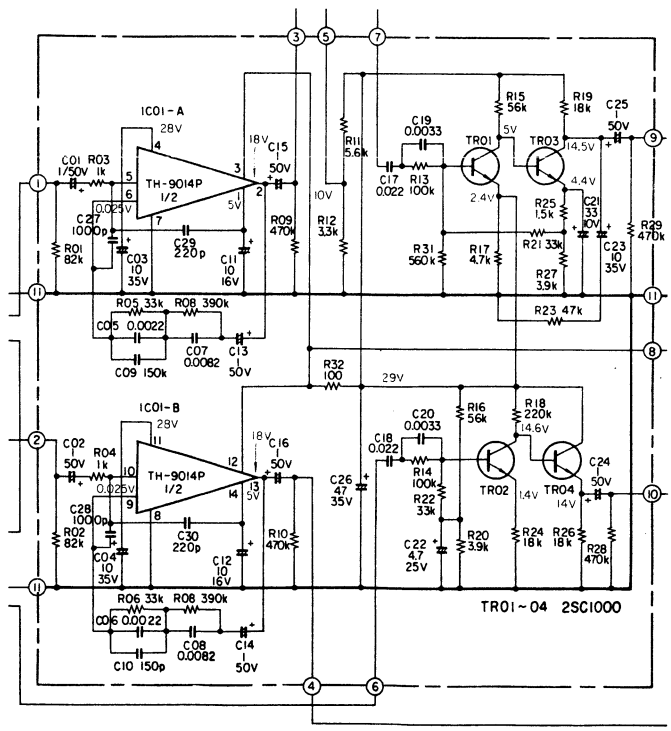
10. SCHEMATIC DIAGRAMS

10-1 EQ CIRCUIT BOARD (AF-C09A)

BOTTOM VIEW

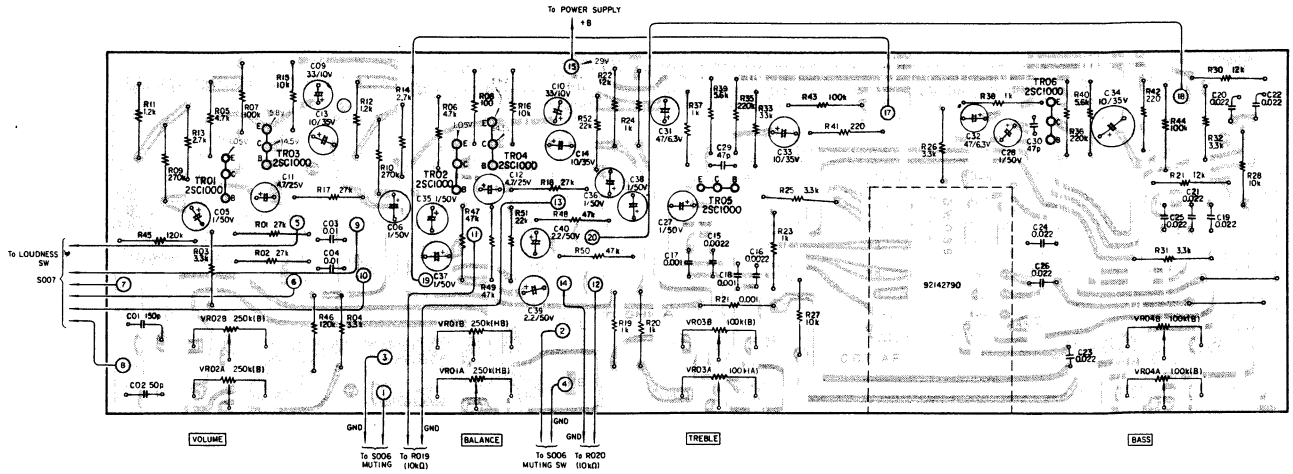


SCHEMATIC DIAGRAM

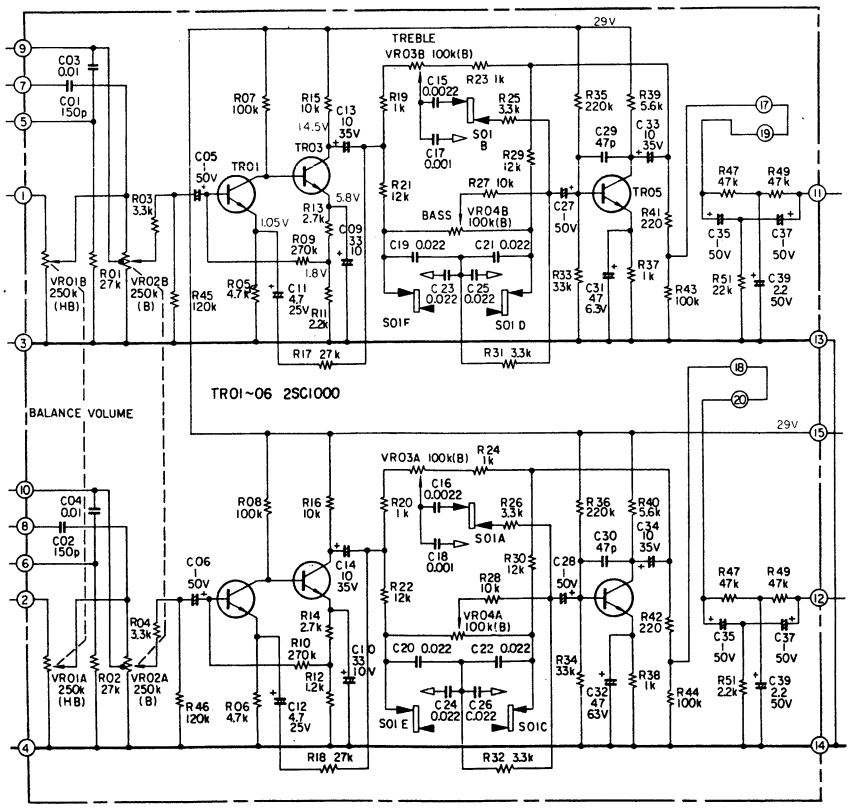


10-2 TONE CONTROL CIRCUIT BOARD (AF-C21)

BOTTOM VIEW

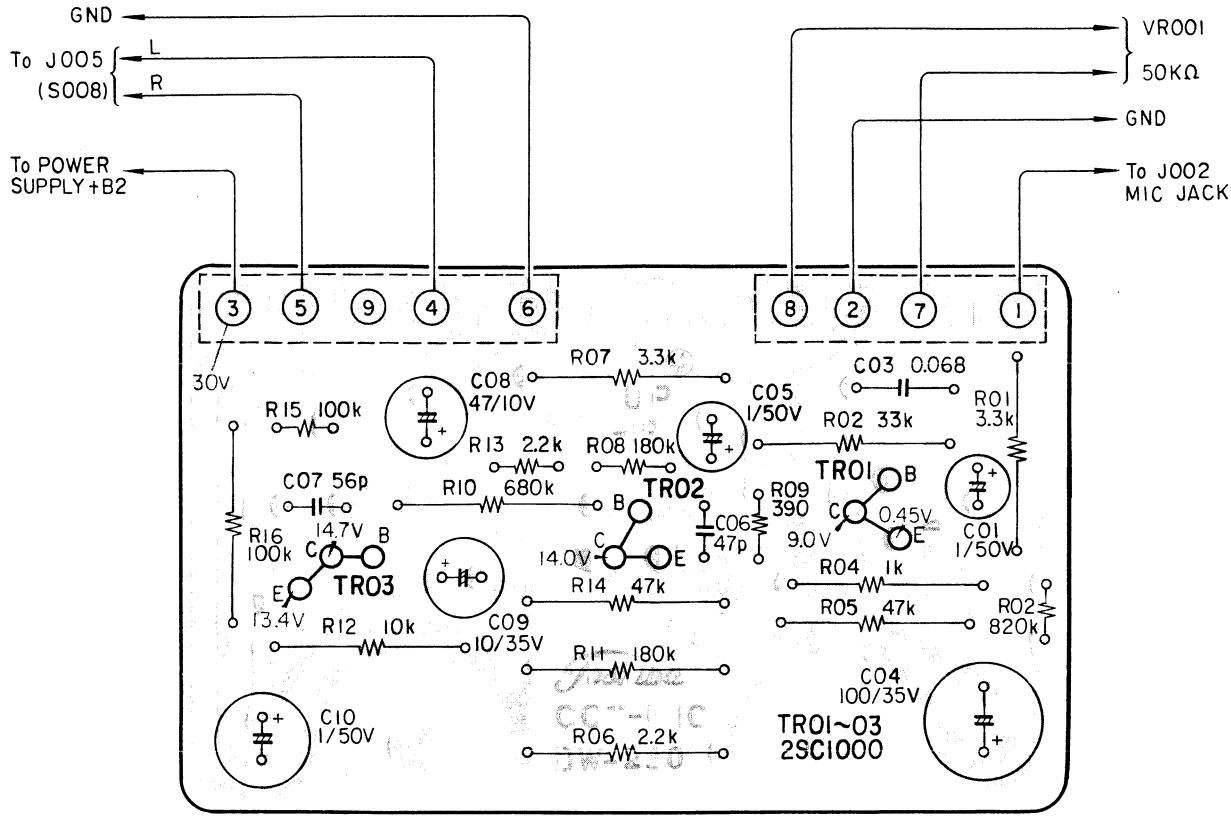


SCHEMATIC DIAGRAM

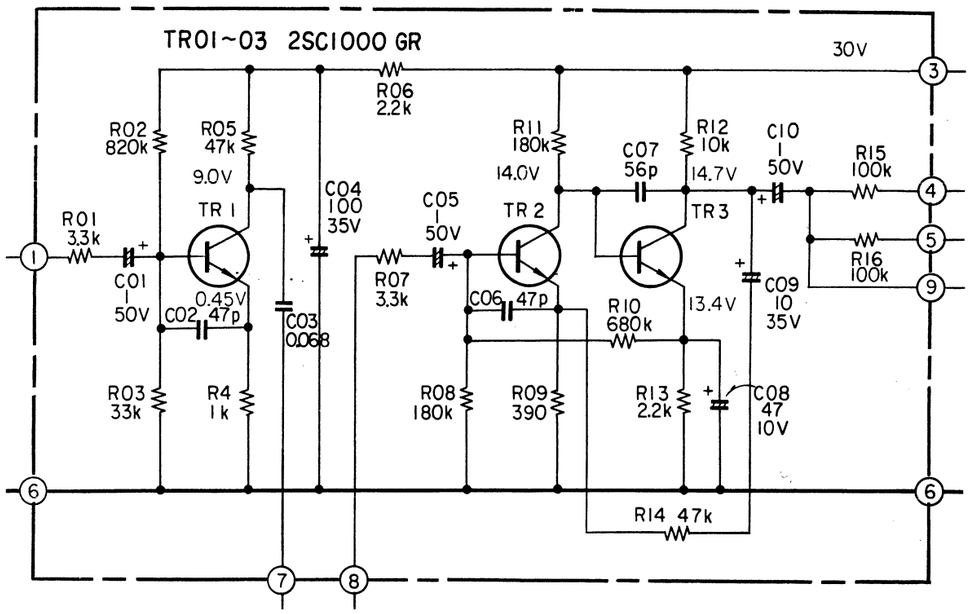


10-3 MIC AMP CIRCUIT BOARD (MIC-C01)

BOTTOM VIEW

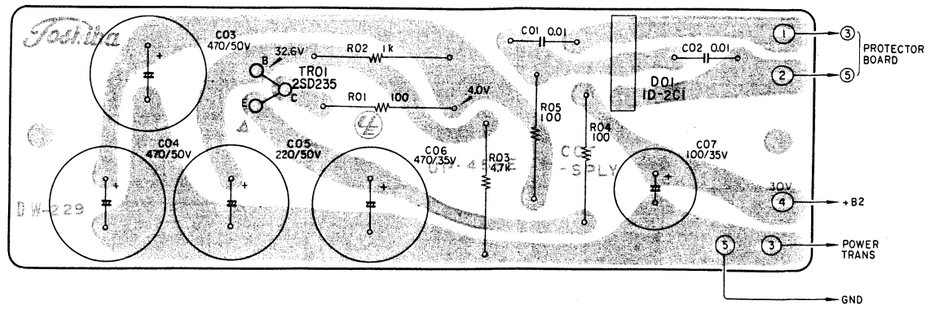


SCHEMATIC DIAGRAM

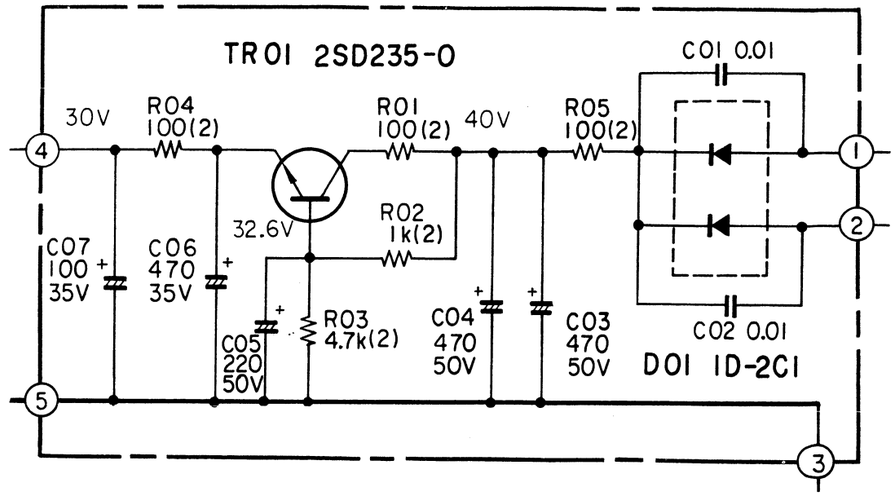


10-4 POWER SUPPLY CIRCUIT BOARD (SPLY-C08)

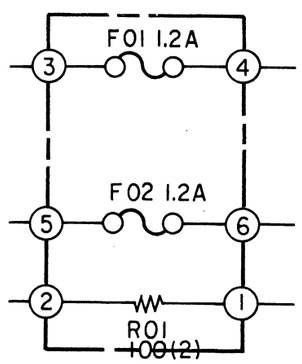
BOTTOM VIEW

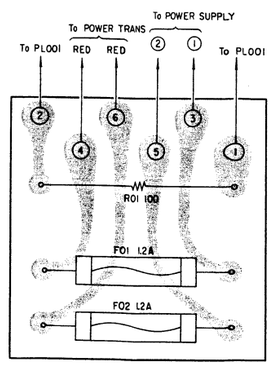


SCHEMATIC DIAGRAM



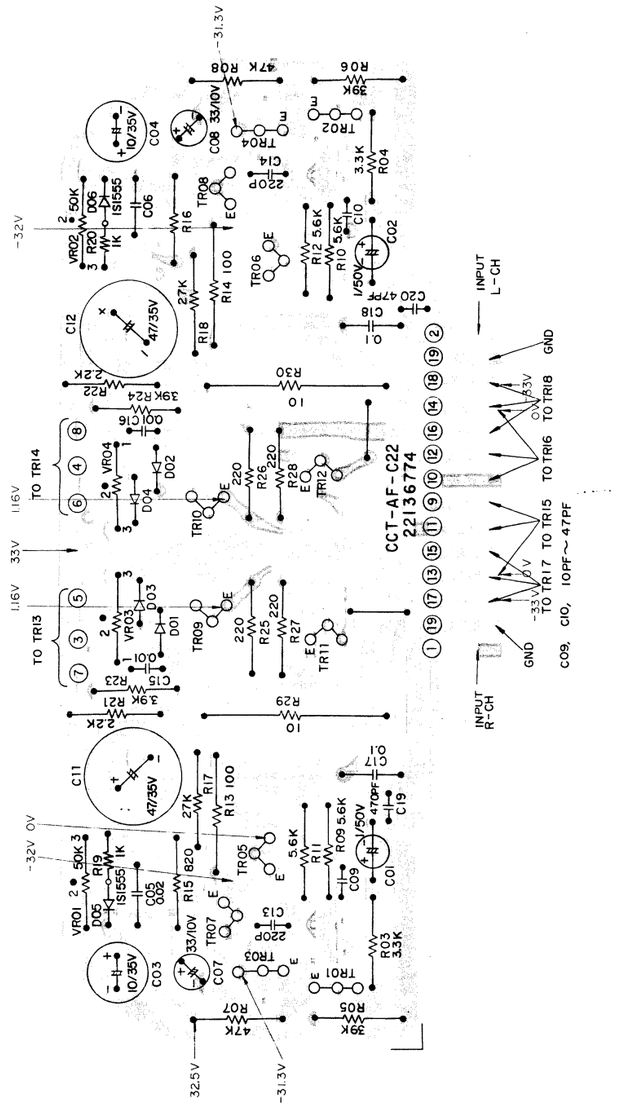
10-5 PROTECTOR CIRCUIT BOARD (PRO-C05)



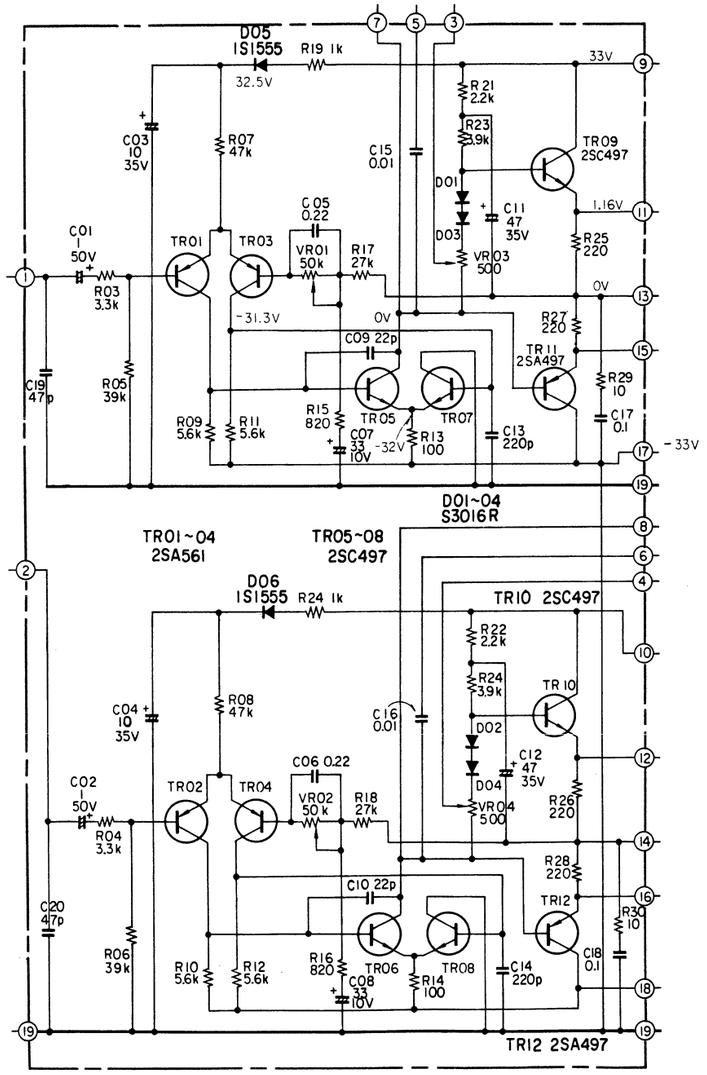


10-6 DRIVER CIRCUIT BOARD (AF-C22)

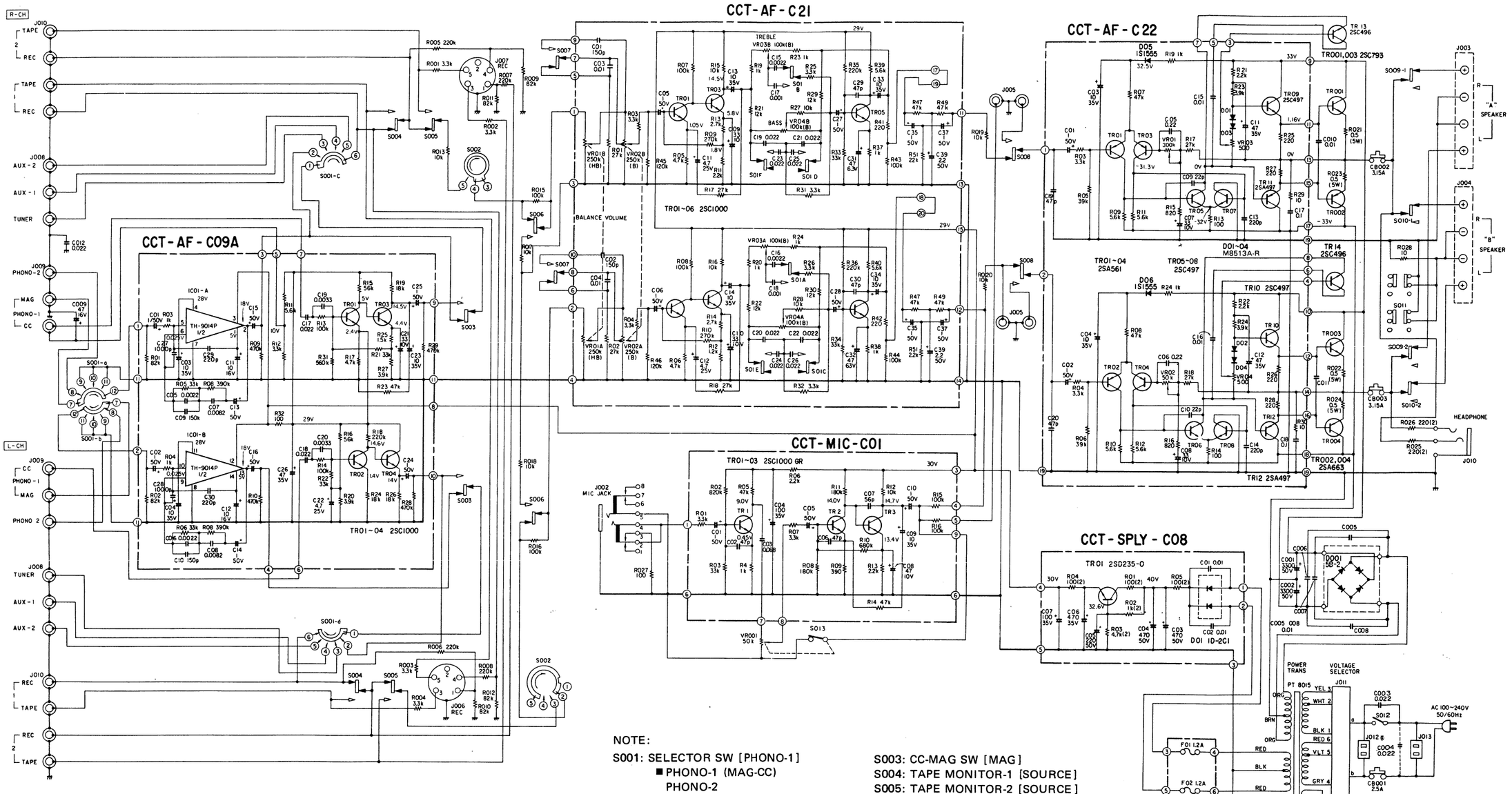
BOTTOM VIEW



SCHEMATIC DIAGRAM



11. GENERAL



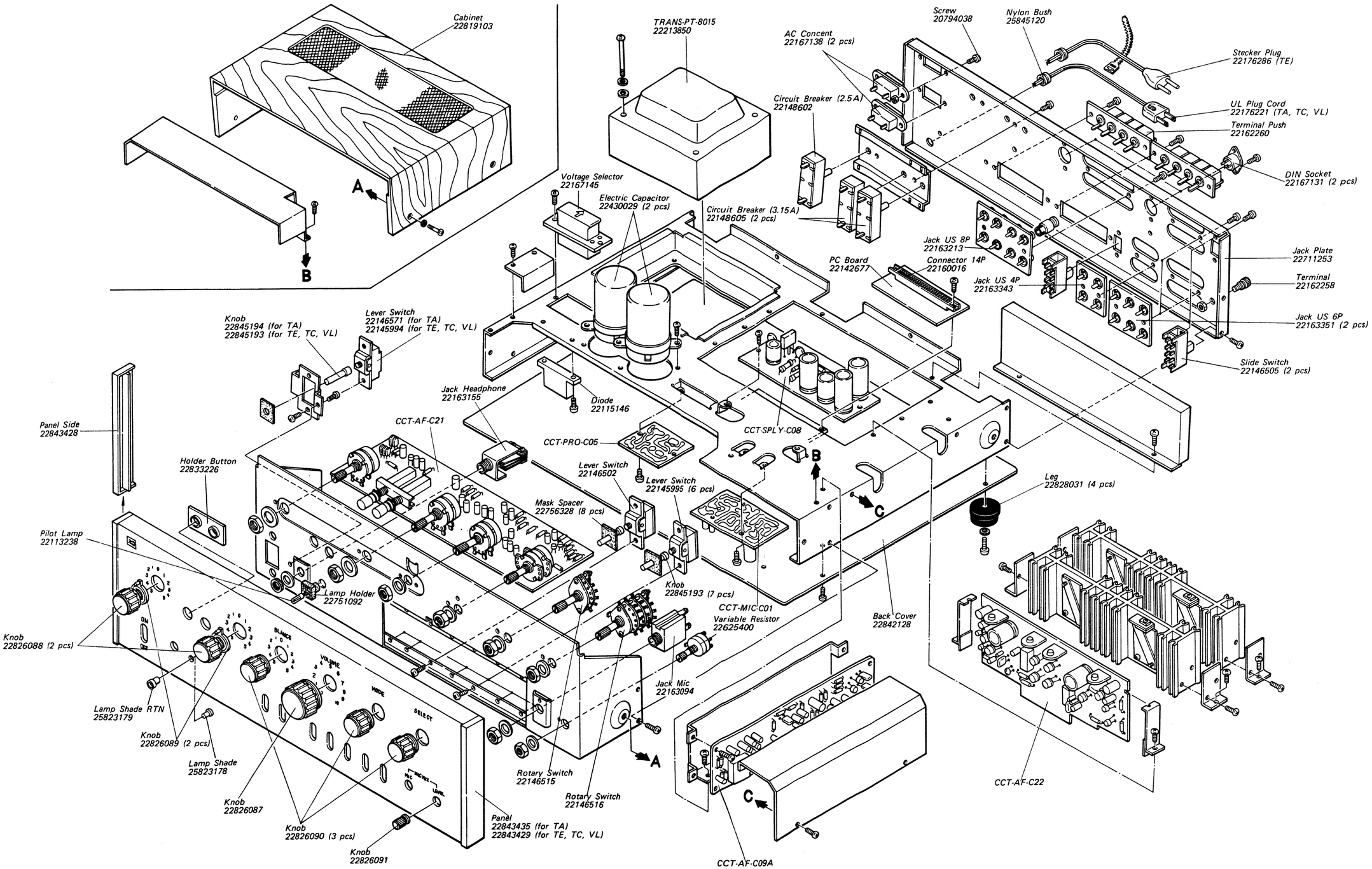
NOTE:

S001: SELECTOR SW [PHONO-1]
- ■ PHONO-1 (MAG-CC)
- PHONO-2
- TUNER
- AUX-1
- AUX-2

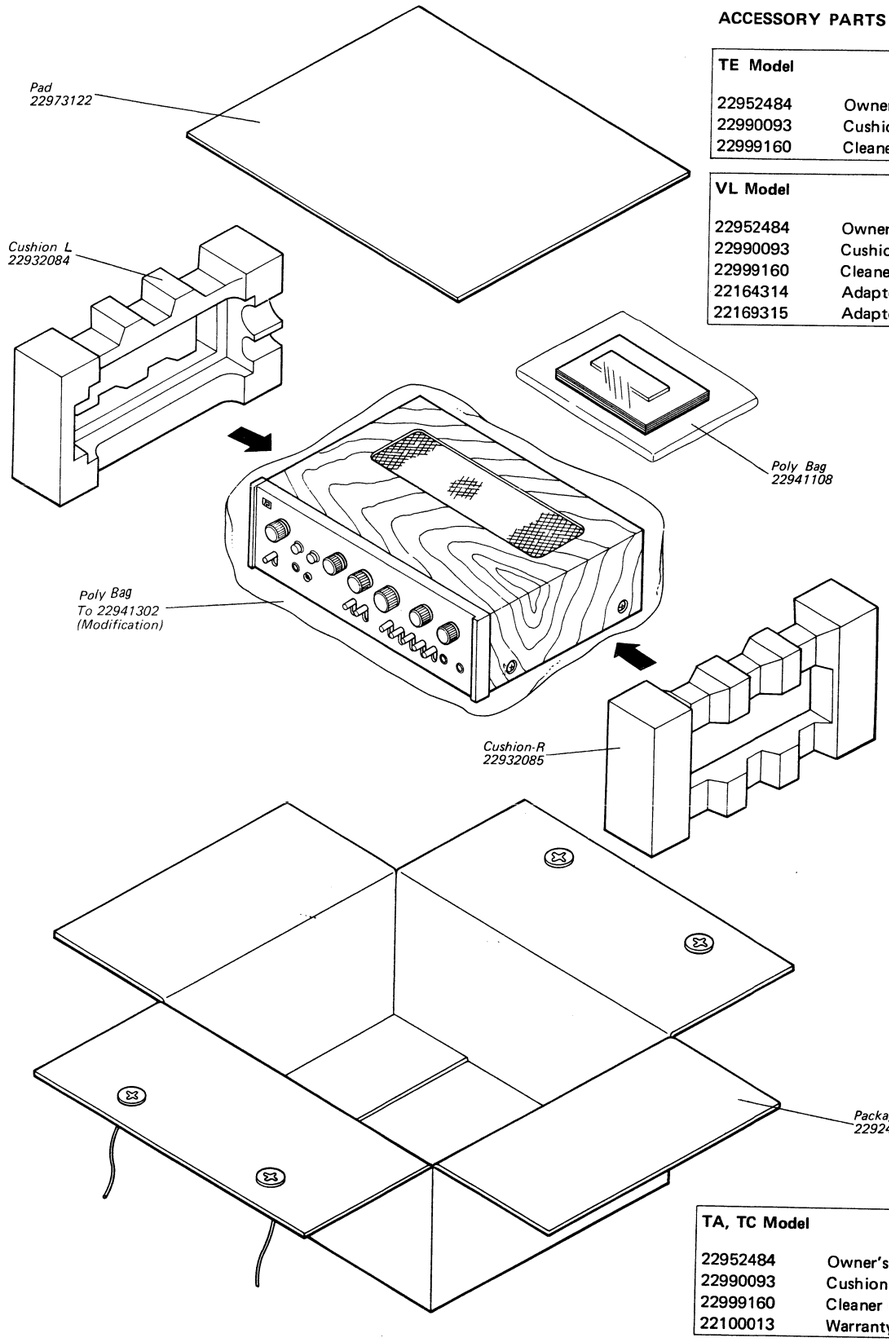
S002: MODE SW [REV]
- ■ REV
- STEREO
- L
- R
- L+R

S003: CC-MAG SW [MAG]
S004: TAPE MONITOR-1 [SOURCE]
S005: TAPE MONITOR-2 [SOURCE]
S006: MUTING SW [OFF]
S007: LOUDNESS SW [OFF]
S008: CHANNEL SW [2CH]
S009: SPEAKER A SW [ON]
S010: SPEAKER B SW [ON]
S011: FOUR CH SW [2CH]
S012: POWER SW [OFF]
S013: MIC SW [OFF]

12. EXPLODED VIEW



13. PACKING



ACCESSORY PARTS

TE Model	
22952484	Owner's Manual
22990093	Cushion Assembly
22999160	Cleaner Cloth

VL Model	
22952484	Owner's Manual
22990093	Cushion Assembly
22999160	Cleaner Cloth
22164314	Adaptor AC Plug
22169315	Adaptor AC Plug

TA, TC Model	
22952484	Owner's Manual
22990093	Cushion Assembly
22999160	Cleaner Cloth
22100013	Warranty (ARf)

14. PARTS LIST

SYMBOL No.	PART No.	DESCRIPTION
EQ UNIT ASSEMBLY (CCT-AF-C09A)		
RESISTORS		
R01,02	22544823	82k ohm ±10% 1/8W RD
R03,04	22544102	1k ohm ±10% 1/8W RD
R05,06	22543333	33k ohm ±5% 1/8W RD
R07,08	22543394	390k ohm ±5% 1/8W RD
R09,10	22544474	470k ohm ±10% 1/8W RD
R11	22544562	5.6k ohm ±10% 1/8W RD
R12	22544332	3.3k ohm ±10% 1/8W RD
R13,14	22544104	100k ohm ±10% 1/8W RD
R15,16	22544563	56k ohm ±10% 1/8W RD
R17	22544472	4.7k ohm ±10% 1/8W RD
R18	22544224	220k ohm ±10% 1/8W RD
R19	22544183	18k ohm ±10% 1/8W RD
R20	22544392	3.9k ohm ±10% 1/8W RD
R21,22	22544333	33k ohm ±10% 1/8W RD
R23	22544473	47k ohm ±10% 1/8W RD
R24	22544183	18k ohm ±10% 1/8W RD
R25	22544152	1.5k ohm ±10% 1/8W RD
R26	22544183	18k ohm ±10% 1/8W RD
R27	22544392	3.9k ohm ±10% 1/8W RD
R28,29	22544474	470k ohm ±10% 1/8W RD
R30	—	—
R31	22544564	560k ohm ±10% 1/8W RD
R32	22544101	100 ohm ±10% 1/8W RD
CAPACITORS		
C01,02	22448109	1μF 50WV CE
C03,04	22447100	10μF 35WV CE
C05,06	22371222	0.0022μF ±5% 50V MY
C07,08	22371822	0.0082μF ±5% 50V MY
C09,10	—	—
C11,12	22445100	10μF 16WV CE
C13,14,15,16	22448109	1μF 50WV CE
C17,18	22373223	0.022μF ±20% 50V MY
C19,20	22373332	0.0033μF ±20% 50V MY
C21	22443330	33μF 10WV CE
C22	22446479	4.7μF 25WV CE
C23	22447100	10μF 35WV CE
C24,25	22448109	1μF 50WV CE
C26	22447470	47μF 35WV CE
C27,28	22343102	0.001μF 50V CK
C29,30	22343221	220pF 50V CK
SEMICONDUCTORS		
IC01		TH9014P
TR01,02,03,04		2SC1000-GR
TONE UNIT ASSEMBLY (CCT-AF-C21)		
RESISTORS		
R01,02	22544273	27k ohm ±10% 1/8W RD
R03,04	22544332	3.3k ohm ±10% 1/8W RD
R05,06	22544472	4.7k ohm ±10% 1/8W RD
R07,08	22544104	100k ohm ±10% 1/8W RD
R09,10	22544274	270k ohm ±10% 1/8W RD
R11,12	22544122	1.2k ohm ±10% 1/8W RD
R13,14	22544272	2.7k ohm ±10% 1/8W RD
R15,16	22544103	10k ohm ±10% 1/8W RD
R17,18	22544273	27k ohm ±10% 1/8W RD
R19,20	22544102	1k ohm ±10% 1/8W RD
R21,22	22544123	12k ohm ±10% 1/8W RD
R23,24	22544102	1k ohm ±10% 1/8W RD
R25,26	22544332	3.3k ohm ±10% 1/8W RD
R27,28	22544103	10k ohm ±10% 1/8W RD
R29,30	22544123	12k ohm ±10% 1/8W RD
R31,32	22544332	3.3k ohm ±10% 1/8W RD
R33,34	22544333	33k ohm ±10% 1/8W RD
R35,36	22544224	220k ohm ±10% 1/8W RD
R37,38	22544102	1k ohm ±10% 1/8W RD
R39,40	22544562	5.6k ohm ±10% 1/8W RD
R41,42	22544221	220 ohm ±10% 1/8W RD
R43,44	22544104	100k ohm ±10% 1/8W RD
R45,46	22544124	120k ohm ±10% 1/8W RD
R47,48,49,50	22544473	47k ohm ±10% 1/8W RD
R51,52	22544223	22k ohm ±10% 1/8W RD
VR01,A,B	22651405	250k ohm (MN) BALANCE
VR02,A,B	22651410	250k ohm (B) VOLUME
VR03,04,A,B	22655403	100k ohm (B) BASS TREBLE
CAPACITORS		
C01,02	22362151	150pF ±10% 50V CC(SL)
C03,04	22373103	0.01μF ±20% 50V MY
C05,06	22448109	1μF 50WV CE
C07,08	—	—
C09,10	22443330	33μF 10WV CE
C11,12	22446479	4.7μF 25WV CE
C13,14	22447100	10μF 35WV CE
C15,16	22373222	0.0022μF ±20% 50V MY
C17,18	22373102	0.001μF ±20% 50V MY
C19,20,21, 22,23,24,25,26	22373223	0.022μF ±20% 50V MY
C27,28	22448109	1μF 50WV CE
C29,30	22362470	47pF ±10% 50V CC(SL)
C31,32	22442470	47μF 63WV CE
C33,34	22447100	10μF 35WV CE
C35,36,37,38	22448109	1μF 50WV CE
C39,40	22448229	2.2μF 50WV CE
SW01	22146273	Multi Frequency Responser
	22845201	Cap
SEMICONDUCTORS		
TR01,02,03 04,05,06		2SC1000-GR
MIC UNIT ASSEMBLY (CCT-MIC-C01)		
RESISTORS		
R01	22544332	3.3k ohm ±10% 1/8W RD
R02	22554824	820k ohm ±10% 1/8W Single ended
R03	22544333	33k ohm ±10% 1/8W RD
R04	22544102	1k ohm ±10% 1/8W RD
R05	22544473	47k ohm ±10% 1/8W RD
R06	22544222	2.2k ohm ±10% 1/8W RD
R07	22544332	3.3k ohm ±10% 1/8W RD
R08	22554184	180k ohm ±10% 1/8W RD
R09	22554391	390k ohm ±10% 1/8W RD
R10	22544684	680k ohm ±10% 1/8W RD
R11	22544184	180k ohm ±10% 1/8W RD
R12	22544103	10k ohm ±10% 1/8W RD
R13	22554222	2.2k ohm ±10% 1/8W Single ended
R14	22544473	47k ohm ±10% 1/8W RD
R15	22554104	100k ohm ±10% 1/8W Single ended
R16	22544104	100k ohm ±10% 1/8W RD
CAPACITORS		
C01	22448109	1μF 50WV CE
C02	22362470	47pF ±10% 50V CC(SL)
C03	22373683	0.068μF ±20% 50V MY
C04	22447101	100μF 35WV CE
C05	22448109	1μF 50WV CE
C06	22362470	47pF ±10% 50V CC(SL)
C07	22362560	56pF ±10% 50V CC(SL)
C08	22447470	47μF 35WV CE
C09	22447100	10μF 35WV CE
C10	22448109	1μF 50WV CE
SEMICONDUCTOR		

SYMBOL No.	PART No.	DESCRIPTION
TR01,02,03		2SC1000-GR
DRIVER UNIT ASSEMBLY (CCT-AF-C22)		
RESISTORS		
R03,04	22544332	3.3k ohm ±10% 1/8W RD
R05,06	22544393	39k ohm ±10% 1/8W RD
R07,08	22544473	47k ohm ±10% 1/8W RD
R09,10	22544562	5.6k ohm ±10% 1/8W RD
R11,12	22544562	5.6k ohm ±10% 1/8W RD
R13,14	22570021	100 ohm ±10% 2W RN
R15,16	22544821	820 ohm ±10% 1/8W RD
R17,18	22544273	27k ohm ±10% 1/8W RD
R19,20	22544102	1k ohm ±10% 1/8W RD
R21,22	22544222	2.2k ohm ±10% 1/8W RD
R23,24	22544392	3.9k ohm ±10% 1/8W RD
R25,26	22544221	220 ohm ±10% 1/8W RD
R27,28	22544221	220 ohm ±10% 1/8W RD
R29,30	22500047	10 ohm ±10% 5W RW
VR01,02	22658252	50k ohm Semi fixed
	To 22658188 (Modification)	300k ohm Semi fixed
VR03,04	22658189	500 ohm Semi fixed
CAPACITORS		
C01,02	22448109	1μF 50WV CE
C03,04	22448100	10μF 50WV CE
C05,06	22373224	0.22μF ±20% 50V MY
C07,08	22443330	33μF 10WV
C09,10	22362220	22pF ±10% 50V CC(SL)
C11,12	22447470	47μF 35WV CE
C13,14	22362221	220pF ±10% 50V CC(SL)
C15,16	22373103	0.01μF ±20% 50V MY
C17,18	22373104	0.1μF ±20% 50V MY
C19,20	22362470	47pF ±10% 50V CC(SL)
SEMICONDUCTORS		
TR01,02		2SA561-Y
TR03,04		2SA561-Y
TR05,06		2SC497-Y
TR07,08		2SC497-Y
TR09,10		2SC497-Y
TR11,12		2SA497-Y
TR13,14		2SC496
D01,02		S3016-R
		To M8513A-R (Modification)
D03,04		S3016-R
		To M8513A-R (Modification)
D05,06		IS1555
SUPPLY UNIT ASSEMBLY (CCT-SPLY-C08)		
RESISTORS		
R01	22570021	100 ohm ±10% 2W Metalized Film Resistor
R02	22570024	1k ohm ±10% 2W Metalized Film Resistor
R03	22570057	4.7k ohm ±10% 2W Metalized Film Resistor
R04	22570021	100 ohm ±10% 2W Metalized Film Resistor
R05	22570021	100 ohm ±10% 2W Metalized Film Resistor
CAPACITORS		
C01,02	22340030	0.01μF +100 −0% 500V CK
C03,04	22448471	470μF 50WV CE
C05	22448221	220μF 50WV CE

SYMBOL No.	PART No.	DESCRIPTION
C06	22447471	470μF 35WV CE
C07	22447101	100μF 35WV CE
SEMICONDUCTORS		
TR01		2SD235-O
PROTECTOR UNIT ASSEMBLY (CCT-PRO-C05)		
RESISTORS		
R01	22570021	100 ohm ±10% 2W Metalized Film Resistor
F01,02	22144187	FUSE 1.2A UL
ELECTRICAL PARTS		
	22213850	TRANS-PT8015 (Power TRANS)
S001	22146516	Rotary Switch (Selector)
S002	22146515	Rotary Switch (Mode)
S003,011	22146505	Slide Switch
S004,005,006 007,009,010	22145995	Lever Switch
S008	22146502	Lever Switch
CB001	22148602	Circuit Breaker 2.5A
CB002,003	22148605	Circuit Breaker 3.15A
PL001	22113238	Pilot Lamp 6V 30mA
J001	22163155	Jack Headphone
J002	22163094	Jack Mic
J003,004	22162260	Terminal Push (Speaker)
J005	22163343	Jack US4P
J006,007	22167131	DIN Socket
	To 22163106 (Modification)	
J008,009	22163351	Jack US6P
J010	22163213	Jack US8P
J011	22167145	Voltage Selector
J012,013	22167138	AC Concent
C001,002	22430029	3300μF 50WV Electric Capacitor
C003	22321201	0.022μF ±20% 250V Film Capacitor
C005,006 007,008	22340030	0.01μF 500V Ceramic Capacitor
C009	22445470	47μF 16WV Electric Capacitor
C010,011	22340030	0.01μF 500V CK
C012	22340032	0.02μF 500V CK
R001,002 003,004	22544332	3.3k ohm ±10% 1/8W Carbon Resistor
R005,006 007,008	22544224	220k ohm ±10% 1/8W Carbon Resistor
R009,010 011,012	22544823	82k ohm ±10% 1/8W Carbon Resistor
R013,014 017,018,019 020	22544103	10k ohm ±10% 1/8W Carbon Resistor
R015,016	22544104	100k ohm ±10% 1/8W Carbon Resistor
R021,022, 023,024	22500048	0.5 ohm ±10% 3W Cement Resistor
R025,026	22570022	2200 ohm ±10% 2W Metalized Film Resistor
R027	22544101	100 ohm ±10% 1/8W Carbon Resistor
R028	22500047	10 ohm ±10% 5W Cement Resistor
D001	22115146	D-5B-2 Diode
VR001	22625400	50k ohm A Variable Resistor (MIC LEVEL)
	22116086	Socket (Transistor)
	22142677	PC Board (Connector)
	22160016	Connector 14P
	22162258	Terminal (Earth)
	22162306	Terminal 4P
	22162307	Terminal 5P

SYMBOL No.	PART No.	DESCRIPTION
	22184153	Wire Clip
	~~28701042~~	~~5P Socket-Ass~~
	(Deletion)	
	~~28701043~~	~~4P Socket-Ass~~
	(Deletion)	
	22164379 (Addition)	Plug 5P
	22167411 (Addition)	Socket 5P
A (TA)		
S012	22146571	Lever Switch
B (TE)		
	22751075	Bush
	22176286	Power Cord
C (TA,TC,VL)		
	25845120	Bush SR3P4
	22176221	Power Cord
D (TE,TC,VL)		
S012	22145994	Lever Switch
E (TA,TE,VL)		
C004	22321201	0.022μF ±20% 250V Film Capacitor